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An unending variety of topics

Monday, March 24, 2008

The monetary value of liquid commodities

In modern commodity markets one can exchange money for commodities at almost zero transaction costs. These markets thus reflect not just the supply and demand of the commodity, but also the supply and demand of the currency they are priced in.

Because they combine liquidity with short- and medium-term supply inelasticity, mineral commodities are a good way to hedge a falling currency. When the supply of money increases or is expected to increase, whether because of lower nominal or real interest rates, because the bank that issues the currency is buying government treasury bonds or (like John Law of Mississippi Bubble infamy) mortgage-backed securities[*], or for any other reason, a disproportionate amount of the expected or surprise increase in money supply is soaked up by commodities. Indeed the commodities with the most liquid markets and inelastic supply, such as oil and gold, tend to move in lock-step with each other. Such price movement is strong evidence for the movement being primarily a phenomenon of changing money supply or demand rather than of changing supply or demand for particular commodities. If oil prices were rising primarily due to rising industrial demand for oil, or primarily because oil was getting more expensive technologically to produce (e.g. "peak oil" theory), we'd expect them to move quite differently than gold, which is demanded for primarily non-industrial reasons and has a vastly greater inventory/production ratio on the supply side than oil. That's not what we see -- we see oil and gold moving together, and indeed the price of oil in terms of gold and silver has been practically flat in the recent commodity boom. This is almost entirely due to expected or actual increases in the supplies of the currencies they are traded in (and especially recently in the weak dollar) rather than to "real" factors.

This inflation only slowly percolates into price rises in other goods and services, which tend to be far more rigid than commodities. Wages are particularly rigid. Because the U.S. Federal Reserve and most other central banks regulate their money supplies based on trailing indicators of inflation(e.g. consumer price indices) rather than leading indicators (commodity prices), it is no surprise that their decisions tend to produce boom-and-bust cycles in commodities, and that to a lesser and more delayed extent they cause both general inflation and recessions. No uncommon demand from China or the like is needed to explain the recent commodity boom, just as no such rise in demand or long-term fall in supply was needed to explain the very similar commodity boom in the 1970s. But since most people judge supply and demand of a commodity by nominal price, both in the 1970s and now we get a lot of irrational hysteria about "running out", "peak oil", how our energy industries and consumption are "unsustainable", etc. I'll believe that when oil per barrel doubles or more with respect to gold and silver. When they move together, we're just being fooled by monetary instability, and most of the current disproportionate increase in investment in energy supplies and conservation, whether traditional or renewable, is malinvestment in response to highly distorted nominal price signals, as is the accompanying political bubble of "energy security", conservation enforced through idiotic micro-regulations (e.g. banning traditional light bulbs), and so on.

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Nick Szabo

"A premier thinker about history, law and economics, and the lessons they have for security." -- Adam Shostack, Emergent Chaos

"Szabo comes out with these essays that leave me in awe." -- Brian Dunbar

"Reading material that is eclectic, challenging and endlessly fascinating." -- Sean McGrath, Propylon

"Like most blogs worth my attention, this blog is updated only infrequently. That is because the authors of blogs worth my attention only post when they have something to say that is true, relevant and not already known by their audience. Most of the human race does not have the skill to know when an idea has these three properties. The skill is particularly rare in the fields of politics and economics, which is why this blog is such a rare and valuable thing." -- Richard Hollerith

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Another way of putting this is that, when currencies become unreliable as a store of value, commodities take on part of that monetary role. Both oil and gold increase in value by performing this monetary function better than the currency against which they are being traded, better than credit instruments denominated in that currency, and even better, in the short term, than stocks of companies that do business primarily in that currency. The joint movements in oil and gold reflect their value, relative to the currency they are priced in, performing the monetary function of a store of value. Global supplies and industrial demands for minerals are far less volatile than the change in their value in this monetary role. It's the logical emergence of money from barter, but this emergence goes on every day that liquid commodities act as a better store of value than the currency in which they are priced. Contrariwise, as the currency becomes a better store of value than the commodity, these commodities move back down towards just being commodities valued only for their consumption. Thus their exaggerated moves, both upward and downward, in reaction to changing expectations of future increases or decreases in money supply.

Due to their exaggerated moves and the relative rigidity of most non-commodity prices, commodities themselves are an imperfect store of value. They react far more than the general level of prices to both increases and decreases in money supply, or changing expectations of same. If the Fed stops playing John Law and desists from buying bad mortgages, if others besides the Fed soak up all the new Treasuries produced by large federal budget deficits, ifcounterparty risk in credit markets subsides, the Fed can raise rates, sell securities and retire the money, and otherwise take steps to lower the money supply and stanch inflation. In such a case, commodities will react disproportionately on the downside, as they did in the 1980s. If the Federal Reserve can't do these things, dollars and dollar-denominated securities will continue to decline and people will increasingly turn to commodities to protect their nest eggs. All the ads I see and hear for gold these days suggests the peak of a commodity bubble is near, but on the other hand credit markets may worsen due to the continued crashing of the previous bubble (the housing/mortgage bubble), federal deficits may continue to increase, and the Fed may thus buy even more securities, making commodities even more attractive. I'm thus afraid that I have no buy or sell recommendations for you, dear readers. :-)

[This comment is based on a comment I recently made at the Marginal Revolution blog].

* [Obligatory Wikipedia links: John Law, Mississippi Bubble, BearStearns bailout]

[UPDATE: reader Byrne Hobarth has linked to this excellent analysis of the commodities market. This study debunks the theories that trends in supply or consumption demand, very steady over the last century, have greatly changed over the last decade. In particular, increased demand for many commodities such as copper in China has been offset by slows in growth or declines in demand in Europe and the U.S.

The studies' thesis is that the commodity runup is largely just a bubble. The study shows the spectacular rise in commodity derivatives. These represent far more contractual liability or asset than the underlying commodities. Treating commodities as money, this to me looks like a new emergent form of fractional reserve banking, but reconstructed in the investment rather than the banking sector. These derivatives, on this view, act essentially as private fractional reserve currencies, backed by a variety of commodities. The report views all this as evidence of a bubble. It points out we haven't yet seen the consumer inflation of the previous commodity bull. I emphasize *yet*. Consumer prices are a *trailing* indicator, and I believe the commodity markets are more rational in anticipating and reacting to money supply increases than they were in the 1970s thanks to the dominance of derivatives. The development of these new kinds of currencies, though prone to the risks and errors of novelty, are largely rational.]

Posted by Nick Szabo at 3:55 PM

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Peter McCluskey said...

This hypothesis implies that oil futures should be predicting a continuous rise in oil prices (as is always the case with precious metals, as far as I know). Yet actual oil futures predict a slight decline in oil prices, which indicates that markets believe some of the oil price rise is due to temporary supply/demand imbalances.
Maybe your hypothesis explains a good deal of the oil price rise, but I'm suspicious of attempts to explain it all by a single cause.

7:01 PM

Richard Hollerith said...

Like most blogs worth my attention, this blog is updated only infrequently. That is because the authors of blogs worth my attention only post when they have something to say that is true, relevant and not already known by their audience. Most of the human race does not have the skill to know when an idea has these three properties. The skill is particularly rare in the fields of politics and economics, which is why this blog is such a rare and valuable thing.

Nick Szabo, you rock!

8:40 PM

nick said...

Peter, I agree that there can be temporary supply/demand imbalances in oil not reflected in the gold price, since oil is not nearly as easy to store or transport and is subject to more frequent political risks to drilling, storage, and transport. One can cleary see some oil spikes in the record not accompanied by gold spikes. But these are all short-term departures; over the medium and long term gold and oil prices are highly correlated.

My hypotheses are that

(1) monetary factors are a much larger factor than other medium- or long-term changes in supply and demand (such as industrial demand or geological/technological conditions of supply) in the price moves of mineral commodities (including oil) priced in fiat currencies, and

(2) a substantial fraction of the prices of oil and other mineral commodities in recent commodity booms (as well as, more obviously, those of precious metals) reflects their use as substitutes for currency and currency-denominated debt (as well as, less obviously, currency-linked equity) as a store of value. The current price of storable and near-term inelastic commodities would be much lower if they were demanded merely for consumption.

The supply elasticity and storage costs of mineral commodities differ, so I don't expect these commodities to move in a fully correlated manner in response to changing expectations of money supply. But those with similar elasticities and storage costs will be more closely correlated.

These hypotheses aren't contradicted by the temporary supply/demand hiccups reflected in futures time-curves. Dollar prices have risen dramatically, from 1999 to today, in all parts of the oil futures time-curve and all parts of the gold futures curve, as dollar supply has increased (to combat the millenium bug, the dot-com crash, and now the housing crash), and they have risen far faster than the CPI, as my hypotheses predict. Commodities in the 1980s crashed merely from dollar supply growth beyond demand being substantially slowed, as predicted by my second hypothesis (most of the relative value of commodities as a store of value disappeared).

My hypotheses also predict that if we adjust for the different shapes of the future curves, to eliminate these temporary oil flow hiccups, the price of gold and oil move in an even more correlated manner. That would be an interesting study to do.

It's also possible, but I'm speculating now, that the curve of oil futures is downward sloping because of the current credit crisis and accompanying big injections of money from central banks. By this speculative idea the curve reflects that this credit crisis will probably lessen in future months and years, as will the injections of currency, thus storable oil is needed now more than later to serve as a store of value. If so, only commodities like oil with relatively high storage costs will have downward-sloping futures curves, whereas precious metals retain the normal upward-sloping curves due to lower costs of spot/future arbitrage. I haven't proven to myself that this really works, but it's an idea to ponder.

Richard, I again thank you for your wonderful encouragement!

4:52 PM

Punk Floyd said...

I just checked the ration of oil price to gold price in Excel over the 1998-2008 period.

While the line is pretty much straight, it's not flat: In 1998 a barrel of oil used to cost 0.05 oz of gold. Today the ratio is 0.11 oz for a barrel.

Meanwhile, dollar dropped in value (against Euro) by half.

Together, these two factors pretty much add up to the observed quadrupling of oil prices.

I am nот sure if that's evidence for or against your theory, but here it is.

11:41 AM

nick said...

This comment has been removed by a blog administrator.

1:45 PM

nick said...

(trying again :-)

I just checked the ratio of oil price to gold price in Excel over the 1998-2008 period.

While the line is pretty much straight, it's not flat: In 1998 a barrel of oil used to cost 0.05 oz of gold. Today the ratio is 0.11 oz for a barrel.

Here's great set of charts of the gold/oil ratio. The oil/gold ratio is trading at the top of its historical range: it traded at 0.12 in 1975 and 2002 and 0.11 in 1982, but usually has been closer to the 0.05 and as low as 0.03 in the early 1970s (refuting the idea that oil shortages triggered the inflation of the 1970s: gold went up first, and quite sharply, after the dollar went off gold, a rise trailed by oil). So the current ratio, if maintained, may indicate something a bit beyond the historical norm. This would probably be due to combination of one or more of the following 5 factors:

(1) oil demand to immediate stockpile ratios are far lower than gold, making oil supply less elastic. This makes oil futures a better short-term hedge of inflation than gold.

(2) there is an ongoing historical switch from precious metals to commodity derivatives as the alternative or hedge to fiat currencies, so the precious metals are losing their monetary value relative to other commodities. I expect this trend to continue: as an inflation

hedge other commodities will on average slightly outperform gold.

(3) differences in supply: oil production has been disrupted by the Iraq war, while gold production has not been disrupted. (This echoes the previous highs in the oil/gold ratio which were times of temporary oil supply disruption).

(4) differencs in supply: oil technology not keeping up with geological depletion (not "peak oil", but still getting scarcer a bit faster than the technology is improving).

(5) The supposed increase industrial demand for oil.

(3), (4), and (5) get all the press but account IMHO for only a fraction of the divergence between oil and gold. Indeed, I don't believe (5) is a factor at all: the worlwide growth rate of demand has not shifted upward, rather faster demand growth in Asia has been offset by lower demand growth in the U.S. and Europe. I believe (2), the decline of precious metals relative to commodity derivatives as ways of hedging fiat currency contract terms, to be a dominant factor, and this is consistent with most other mineral commodities also having risen faster than gold and silver over the same timeframe.

3:32 PM

Tony said...

Good Job! :)

3:11 AM

Leena said...

Good post.

7:45 AM

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